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might be made in a Summer : but my servants have been remiss in what was ordered, I must crave your patience till next year.

An Account of Micrographia, or the Physiological Descriptions of Minute Bodies, made by Magnifying Glasses.

The Ingenious and knowing Author of this *Treatise*, Mr. *Robert Hook*, considering with himself, of what importance a faithful *History of Nature* is to the establishing of a solid Systeme of *Natural Philosophy*, and what advantage *Experimental* and *Mechanical* knowledge hath over the *Philosophy of discourse* and *disputation*, and making it, upon that account, his constant busines to bring into that vast Treasury what portion he can, hath lately published a Specimen of his abilities in this kind of study, which certainly is very welcome to the Learned and Inquisitive world, both for the *New discoveries in Nature*, and the *New Inventions of Art*.

As to the *former*, the Attentive Reader of this Book will find, that there being hardly any thing so small, as by the help of *Microscopes*, to escape our enquiry, a new visible world is discovered by this means, and the Earth shews quite a new thing to us, so that in every *little particle* of its matter, we may now behold almost as great a variety of creatures, as we were able before to reckon up in the whole *Universe* it self. Here our Author maketh it not improbable, but that, by these helps the subtilty of the composition of Bodies, the structure of their parts, the various texture of their matter, the instruments and manner of their inward motions, and all the other appearances of things, may be more fully discovered; whence may emerge many admirable advantages towards the enlargement of the *Active* and *Mechanick* part of knowledge, because we may perhaps be enabled to discern the secret

workings of *Nature*, almost in the same manner, as we do those that are the productions of *Art*, and are managed by *Wheels*, and *Engines*, and *Springs*, that were devised by Humane wit. To this end, he hath made a very curious Survey of all kinds of bodies, beginning with the *Point of a Needle*, and proceeding to the *Microscopical view of the Edges of Razors, Fine Lawn, Tabby, Watered Silks, Glass-canapes, Glass-drops, Fiery Sparks, Fantastical Colours, Metal-line Colours, the Figures of Sand, Gravel in Urine, Diamonds in Flints, Frozen Figures, the Kettering Stone, Charcoal, Wood and other Bodies petrified, the Pores of Cork, and of other substances, Vegetables growing on blighted Leaves, Blew mould and Mushrooms, Sponges, and other Fibrous Bodies, Sea-weed, the Surfaces of some Leaves, the stirring points of a Nettle, Cowage, the Beard of a wild Oate, the seed of the Corn-violet, as also of Tyme, Poppy and Purflane*. He continues to describe *Hair, the scales of a Soal, the sting of a Bee, Feathers in general, and in particular those of Peacocks; the feet of Flies; & other Insects; the Wings and Head of a Fly: the Teeth of a Snail; the Eggs of Silk-worms; the Blue Fly: a water Insect; the Tufted Gnat; a White Moth; the Shepherds-spider; the Hunting Spider, the Ant; the wandring Mite; the Crab-like insect, the Book-worm, the Flea, the Louse, Mites, Vine-mites*. He concludeth with taking occasion to discourse of two or three very considerable subjects, viz. *The inflexion of the Rays of Lights in the Air; the Fixt starrs; the Moon*.

In representing these particulars to the Readers view, the Author hath not only given proof of his singular skil in delineating all sorts of Bodies (he having drawn all the *Schemes* of these 60 *Microscopical* objects with his own hand) & of his extraordinary care of having them so curiously engraven by the Masters of that Art; but he hath also suggested in the several reflexions, made upon these Objects, such conjecturs, as are likely to excite and quicken the Philosophicall heads to very noble contemplations. Here are found inquiries concerning the *Propagation of Light* through differing me- diums;

diums; concerning *Gravity*; concerning the *Roundness* of Fruits, stones, and divers artificial bodies; concerning *Springiness* and *Tenacity*; concerning the *Original of Fountains*; concerning the *dissolution of Bodies into Liquors*; concerning *Filtration*, and the ascent of Juices in Vegetables, and the use of their *Pores*. Here an attempt is made of solving the strange *Phænomena of Grass-drops*; experiments are alleged to prove the *Expansion of Glass* by heat, and the *Contraction of heated-Glass* upon cooling; *Des Cartes* his *Hypothesis of colours* is examined: the *cause of Colours*, most likely to the Author, is explained: Reasons are produced, that *Reflection* is not necessary to produce *colours*, nor a *double refraction*: some considerable *Hypotheses* are offered, for the explication of *Light* by *Motion*; for the producing of all colors by *Refraction*; for reducing all sorts of colors to two only, *Yellow* and *Blew*; for making the *Air*, a *dissolvent of all Combustible Bodies*: and for the explicating of all the regular figures of *Salt*, where he alleges many notable instances of the *Mathematicks of Nature*, as having even in those things which we account *vile, rude and coarse*, shewed abundance of *curiosity and excellent Geometry and Mechanism*. And here he opens a large field for inquiries, and proposeth Models for prosecuting them; 1. By making a full collection of all the differing kinds of *Geometrical* figur'd bodies; 2. By getting with them an exact History of their places where they are generated or found: 3. By making store of Tryals in *Dissolusions* and *Coagulations* of severall *Crystallizing Salts*: 4. By making trials on metals, Minerals and stones, by dissolving them in severall *Menstruums*, and *Crystallizing* them, to see what Figures will arise from those several compositums: 5. By compounding & coagulating several Salts together into the same mass, to observe the Figure of that product: 6. By inquiring the closenes or rarity of the texture of those bodies, by examining their *gravity*, and their *refraction, &c.* 7. By examining what operations the fire hath upon several kinds of Salts, what changes it causes in their figures, *Textures*, or *Virtues*

Vertues. 8. By examining their manner of dissolution, or acting upon those bodies dissoluble in them; and the Texture of those bodies before and after the process. 9. By considering, by what and how many means, such and such figures, actions and effects could be produced, and which of them might be the most likely, &c.

He goes on to offer his thoughts about the Pores of bodies, and a *kind of Valves* in wood; about spontaneous generation arising from the Putrefaction of bodies; about the nature of the Vegetation of mold, mushrooms, moss, sponges; to the last of which he scarce finds any Body like it in texture. He adds, from the naturall contrivance, that is found in the leaf of a Nettle, how the stinging pain is created, and thence takes occasion to discourse of the poysoning of Darts. He subjoyns a curious description of the shape, *Mechanism* and use of the *sting* of a *Bee*; and shews the admirable Providence of Nature in the contrivance and fabrick of *Feathers* for Flying. He delivers those particulars about the Figure, parts and use of the head, feet, and wings of a Fly, that are not common. He observes the various wayes of the generations of Insects, and discourses handsomely of the means, by which they seem to act so prudently. He taketh notice of the *Mechanical* reason of the *spider's* Fabrick, and maketh pretty Observations on the hunting Spider, and other Spiders and their Webs. And what he notes of a Flea, Louse, Mites, and Vinegar-worms, cannot but exceedingly please the curious Reader.

Having dispatched these Matters, the Author offers his Thoughts for the explicating of many *Phænomena* of the Air, from the *Infexion*, or from a *Multiplicate Refraction* of the rays of Light within the Body of the *Atmosphere*, and not from a *Refraction* caused by any terminating *superficies* of the Air above, nor from any such exactly defin'd *superficies* within the body of the *Atmosphere*: which conclusion he grounds upon this, that a *medium*, whose parts are *unequally dense*, and mov'd by various motions and transpositions as to one another, will produce all these visible

visible effects upon the rays of Light, without any other *coefficient* cause: and then, that there is in the Air or *Atmosphere*, such a variety in the constituent parts of it, both as to their *density* and *rarity*, and as to their divers mutations and positions one to another.

He concludeth with two *Celestial Observations*; whereof the *one* imports, what multitudes of Stars are discoverable by the *Telescope*, and the variety of their magnitudes: intimating with all, that the longer the Glasses are, and the bigger apertures they will indure, the more fit they are for these discoveries: the *other* affords a description of a *Vale* in the *Moon*, compared with that of *Hevelius* and *Ricciolo*; where the Reader will find several curious and pleasant Annotations, about the Pits of the *Moon*, and the Hills and Coverings of the same; as also about the variations in the *Moon*, and its *gravitating principle*, together with the use, that may be made of this Instance of a gravity in the *Moon*.

As to the *Inventions of Art*, described in this Book, the curious Reader will there find these following:

1. A *Baroscope*, or an Instrument to shew all the Minute Variations in the *Pressure of the Air*; by which he affirms, that he finds, that before and during the time of rainy weather, the Pressure of the Air is less; and in dry weather, but especially when an *Easterly Wind* (which having past over vast Tracts of Land, is heavy with earthy particles) blows, it is much more, though these changes be varied according to very odd Laws.

2. A *Hygroscope*, or an Instrument, whereby the *Watery steams*, volatile in the Air, are discerned, which the Note it self is not able to find. Which is by him fully described in the Observation touching the *Beard of a wild Oate*, by the means whereof this Instrument is contrived.

3. An Instrument for *graduating Thermometers*, to make them *Standards of Heat and Cold*.

4. A *New Engin* for *Grinding Optick Glasses*, by means of which he hopes, that any Spherical Glasses, of what length soeyer,

soever, may be speedily made: which seems to him most easie, because, if it succeeds, with one and the same Tool may be ground an *Object Glass* of any length or breadth requisite, and that with very little or no trouble in fitting the *Engin*, and without much skill in the *Grinder*. He thinks it very exact, because to the very last stroke the *Glass* does regulate and rectifie the *Tool* to its exact Figure; and the longer or more the *Tool* and *Glass* are wrought together, the more exact will both of them be of the desired Figure. He affirms further, that the motions of the *Glass* and *Tool* do so cross each other, that there is not one point of either's surface, but hath thousands of cross motions thwarting it, so that there can be no kind of *Rings* or *Gutters* made, either in the *Tool* or *Glass*.

5. A *New Instrument*, by which the *Refraction* of all kinds of Liquors may be exactly measured, thereby to give the Curious an opportunity of making Trials of that kind, to establish the *Laws of Refraction*, to wit, whether the *Sines of the Angles of Refraction are respectively proportionable to the Sines of the Angles of Incidence*: This Instrument being very proper to examine very accurately, and with little trouble, and in small quantities, the *Refraction* of any Liquor, not onely for one inclination, but for all, whereby he is enabled to make accurate *Tables*. By the same also he affirms to have found it true, that what proportion the *Sine of the Angle of the one inclination* has to the *Sine of its Angle of Refraction*, correspondent to it, the same proportion have all the other *Sines of Inclination* to their respective *Sines of Refractions*.

Lastly, this Author despairs not that there may be found many Mechanical Inventions, to improve our Senses of *Hearing, Smelling, Tasting, Touching*, as well as we have improved that of *Seeing* by *Optick Glasses*.